AMENDMENTS TO THE CLAIMS

1.(currently amended): A network system [[,]] comprising a high ⌐ der node network performing label switching, which includes including a plurality of high- ⌐ er nodes and a plurality of low-order nodes, each of the low-order nodes is connected to ⌐ e of the plurality of high-order nodes, in which data transferred from each of the low-order n⌐ s is transferred and transfers data to another low-order node through the high-order node net⌐ k, wherein the network system comprising:

the high-order node network comprises a first and second ⌐ h-order node nodes, each of which is provided on the high-order network as one of the plurali ⌐ of high-order nodes; and a second high-order node,

a first low-order node is provided on the high-order netwo ⌐ as one of the plurality of low-order nodes, wherein the first low-order node is connecte ⌐ o the first and second high-order nodes via at least one physical line comprise a first low-order ⌐ le as a low-order node of the first high-order node,

wherein the first low-order node comprises comprising:

a first output port to transmit data to the first high-order n⌐ via said at least one physical line:

a second output port to transmit data to the second high-or ⌐ node via said at least one physical line:

a selecting section to select one of the first and second out ⌐ ports in order that the first low-order node transmits data to one of the first and second high ⌐ ler nodes:

a detection section detecting, in the case of the first output ⌐ rt is selected by the selecting section, a communication failure between the first low-order no ⌐ and the first high-order node;

a host change request section making a request to requesti ⌐ he second

3

high-order node that the second high-order node serves as a high-order n(([[of]] for the first

low-order node in place of the first high-order node when the detection se c on detects the

communication failure; and

a low-order node setting section performing at least one ol - recess processes for

causing the first low-order node to transmit data to the second high-order r de in place of the

first high-order node on the basis of [[the]] process information transmitt :, from the second

high-order node, wherein the selecting section selects the second output ן (.as one of the

processes, and

wherein the second high-order node comprises comprising:

a high-order node setting section performing at least one ef rocess for causing

the second high-order node to transmit data received from the first low-oı (r node to another

low-order node corresponding to a destination of the data according to th : ·quest of the host

change request section; and

a process information transmission section transmitting th : rocess information

corresponding to the process performed by the high-order node setting se ;)n to the first

low-order node.

2.(currently amended): A network system [[,]] comprising a high (der node network

performing label switching, which includes including a plurality of high-· ɾ er nodes and a

plurality of low-order nodes, each of the low-order nodes is connected to c e of the plurality of

high-order nodes, in which data transferred from each of the low-order n ɔ ɔs is transmitted and

transfers data to another low-order node through the high-order node net / 'k, wherein the

network system comprising:

the high-order node network comprises a first and second ı h-order node nodes,

each of which is provided on the high-order network as one of the plurali : ɔf high-order nodes;

and a second high-order node,

4

11184005.01

PAGE 6/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

a first low-order node is provided on the high-order netwc r as one of the plurality of low-order nodes, ~~comprises a first low-order node serving as a~~ ~~ow order node of the~~ ~~first high~~ order node wherein the first low-order node is connected to the i st and second high-order nodes via at least one physical line and includes a first output port t ransmit data to the first high-order node via said at least one physical line, a second output p o to transmit data to the second high-order node via said at least one physical line, and a selec i g section to select one of the first and second output ports in order that the first low-order n h transmits data to one of the first and second high-order nodes,

wherein the first high-order node ~~comprises~~ comprising:

a detection section detecting, in the case of when the first i put port is selected by the selecting section, a communication failure between the first high-c r r node and the first low-order node; and

a host change request section making a request to ~~requesti~~ the second high-order node that the second high-order node serves as a high-order n(([[of]] for the first low-order node in place of the first high-order node when the detection st c on detects the communication failure,

wherein the second high-order node ~~comprises~~ comprising:

a high-order node setting section performing at least one e ? rocess for causing the second high-order node to transmit data received from the first low-oi d : node to another low-order node corresponding to a destination of the data according to th: quest of the host change request section; and

a process information transmission section transmitting pr * ss information corresponding to the process performed by the high-order node setting se i in to the first low-order node, ~~and~~

wherein the first low-order node ~~comprises~~ comprising:

a low-order node setting section performing at least one ~~of~~ i cess for causing the

5

11184005.01

PAGE 7/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

first low-order node to transmit data to the second high-order node in pla : of the first high-order

node on the basis of the process information transmitted from the proces: formation

transmission section, wherein the selecting section selects the second out) :port based on the

process information.

3.(currently amended): A network system [[,]]comprising a high ~ der node network

performing label switching, which includes ~~including~~ a plurality of high-) :er nodes[[,]] and a

plurality of low-order nodes, each of the low-order nodes is connected to (e of the plurality of

high-order nodes[[,]] and ~~a high-order computer for monitoring at least~~ r ~~of the plurality of~~

~~high-order nodes in which each of the low-order notes~~ transfers data to a (ner low-order node

through the high-order node network, ~~wherein~~ the network system compi i: ng:

~~the high-order node network comprises a~~ first and second i h-order ~~node~~ nodes,

~~and a second high-order node~~ each of which is provided on the high-orde : :twork as one of the

plurality of high-order nodes;

~~the plurality of~~ a first low-order ~~node~~ nodes is provided oi _ e high-order network

as one of the plurality of ~~comprises a first~~ low-order ~~node~~ nodes, ~~servin~~ ; ; a low-order node of

~~the first high-order node~~ wherein the first low-order node is connected to t : first and second

high-order nodes via at least one physical line, and includes a first outpul i rt to transmit data to

the first high-order node via said at least one physical line, a second outp i ort to transmit data

to the second high-order node via said at least one physical line, and a se e ing section to select

one of the first and second output ports in order that the first low-order n r : transmits data to

one of the first and second high-order nodes; and

a high-order computer for monitoring at least the first higl : rder node,

wherein the high-order computer ~~comprises~~ comprising:

a detection section detecting, in the case of when the first) put port is selected

by the selecting section, a failure of the first high-order node; and

6

a host change request section making a request to requesti ₁ the second

high-order node that the second high-order node serves as a high-order n(([[of]] for the first

low-order node in place of the first high-order node when the detection s(c on detects the failure

of the first high-order node,

wherein the second high-order node comprises comprising:

a high-order node setting section performing a process of (₁ .sing the second

high-order node to transmit data received from the first low-order node t(₁other low-order

node corresponding to a destination of the data according to the request o f ₁e host change

request section; and

a process information transmission section transmitting pr) :ss information

corresponding to the process performed by the high-order node setting se ; ₁n to the first

low-order node, and

wherein the first low-order node comprises comprising:

a low-order node setting section for performing at least on : -f process for causing

the first low-order node to transmit data to the second high-order node in ₁ ₁ce of the first high-

order node on the basis of the process information transmitted by the pro ₁ s information

transmission section, wherein the selecting section selects the second out ₁ port based on the

process information.

4.(original): A network system according to the claim 1, where ₁

each of the high-order nodes holds path information corre ₁ ₁nding to a

transmission route of data in the high-order node network,

each of the low-order nodes receives the path information ₁ ₁m a high-order node

corresponding to the low-order node itself and, when data is transferred t) ₁e high-order node,

adds path information corresponding to a destination of the data to the d₂ t:

each of the high-order nodes transmits the data transferr : from a low-order

7

11184005.01

PAGE 9/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

node to another low-order node according to the path information added c he data, the first low-order node further comprises:

a memory section storing path information added to data v. n the data is transmitted to the high-order nodes; and

an updating section for receiving updated path informatioi. ansmitted from the second high-order node to update the memory section on the basis of the i lated path information,

the high-order node setting section of the second high-ord n iode generates updated path information as new path information corresponding to a trai c ar route using the second high-order node as a source node in the high-order node network i ording to a request of the host change request section, and

the process information transfer section of the second high-orde r ode transmits the updated path information formed by the high-order node setting section t i ie first low-order node.

5.(original): A network system according to the claim 2, where i

each of the high-order nodes holds path information corre i nding to a transfer route of data in the high-order node network,

each of the low-order nodes receives the path information f m a high-order node corresponding to the low-order node itself and, when data is transmitted i c he high-order node, adds path information corresponding to a destination of the data to the da ;

each of the high-order nodes transmits the data transmitt e from a low-order node to another low-order node according to the path information added c he data,

the high-order node setting section of the second high-o c r node generates updated path information as new path information corresponding to a trai c ar route using the second high-order node as a source node in the high-order node network i ording to a request

8

11184005.01

PAGE 10/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

of the host change request section,

the process information transmission section of the second gh-order node transmits the updated path information generated by the high-order node ing section to the first low-order node,

the first low-order node further comprises a memory secti storing path information added to data when the data is transmitted to the high-order i es, and

the low-order node setting section of the first low-order no receives the updated path information transmitted from the second high-order node to update storage section on the basis of the updated path information.

6.(original): A network system according to the claim 2, where r

each of the high-order nodes holds path information corre nding to a transfer route of data in the high-order node network,

each of the low-order nodes receives the path information f m a high-order node corresponding to the low-order node itself and, when data is transmitted he high-order node, adds path information corresponding to a destination of the data to the da

each of the high-order nodes transmits the data transmitte om a low-order node to another low-order node according to the path information added to the ta,

the detection section of the first high-order node detects a f lure of the first high-order node itself,

the host change request section of the first high-order nod quests the second high-order node that the second high-order node serves as the high-order t de of the first low-order node in place of the first high-order node when the failure of t irst high-order node itself is detected by the detection section,

the high-order node setting section of the second high-ord node generates updated path information serving as new path information corresponding a transfer route

9

11184005.01

PAGE 11/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

which uses the second high-order node as a source node in the high-order ı de network and does

not comprise the first high-order node according to a request of the host c ı ıge request section,

the process information transmission section of the second] gh-order node

transmits the updated path information generated by the high-order node (;ing section to the

first low-order node,

the first low-order node further comprises a memory secti(ı ;or storing path

information added to data when the data is transmitted to the high-order r (es, and

the low-order node setting section of the first low-order nc (receives the updated

path information transmitted from the second high-order node to update t ı storage section on

the basis of the updated path information.

7.(original): A network system according to the claim 3, where: ı

each of the high-order nodes generates path information cı ı ;sponding to a

transfer route of data in the high-order node network,

each of the low-order nodes receives the path information f ·m a high-order node

corresponding to the low-order node itself and, when data is transmitted 1ɔ he high-order node,

adds path information corresponding to a destination of the data to the da ;

each of the high-order nodes transmits data transmitted frc r a low-order node to

another low-order node according to the path information added to the da ;

the high-order node setting section of the second high-ord ;ı ıode generates

updated path information serving as new path information corresponding t a transfer route

which uses the second high-order node as a source node in the high-ordeı ı ıde network and does

not comprise the first high-order node according to a request of the host (ƚ nge request section,

the process information transmission section of the seconı ·gh-order node

transmits the updated path information generated by the high-order node ; ;ing section to the

first low-order node,

10

11184005.01

PAGE 12/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

the first low-order node further comprises a memory secti·: for storing path

information added to data when the data is transmitted to the high-order ı ɑ les, and

the low-order node setting section of the first low-order nɑ ι receives the updated

path information transmitted from the second high-order node to update ı h storage section on

the basis of the updated path information.

8.(currently amended): A service recovering method in a networl ɪstem[[,]] comprising

a high-order node network constituted by a plurality of high-order nodes ı l a plurality of

low-order nodes, each of the low-order nodes is connected to one of the ɪ l ːality of high-order

nodes, in-which each of the high-order nodes holds having path informat ɕ corresponding to

[[a]] transfer route routes of data in the high-order node network, each of ɪ ǝ low-order nodes

receives receiving the path information from a high-order node correspoɪ ɕ ıg to the low-order

node itself and, when data-is-transmitted transmitting data to the high-orɕ ε node, adds adding

the path information corresponding to a destination of the data to the datɑ , ach of the high-order

nodes transmits transmitting the data transmitted received from a low-orɪ ·node toward another

low-order node according to path information added to the data, the plurɑ l ɣof high-order node

nodes network-comprises including a first and second high-order node nɪ ɪs, and-a-second-high

order-node, and the plurality of low-order nodes comprise including a fiɪ s low-order node,

serving-as-a-low-order-node-of-the-first-high-order-node,-wherein the metɪ l comprising:

the first low-order node detecting a communication failurɕ ɪtween the first high-

order node and the first low-order node, wherein the first low-order node i connected to the first

and second high-order nodes via at least one physical line, and includes ɑ ɪ st output port to

transmit data to the first high-order node via said at least one physical linɕ ι second output port

to transmit data to the second high-order node via said at least one physicɑ line, and a selecting

section to select one of the first and second output ports in order that the ɪ ɪt low-order node

transmits data to one of the first and second high-order nodes, and the firɪ ow-order node

11

11184005.01

PAGE 13/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

detects the communication failure when the first output port is selected b : ie selecting section;

the first low-order node ~~requests~~ requesting to the second : i h-order node that the second high-order node serves as ~~the~~ a high-order node [[of]] for the first l v-order node in place of the first high-order node when ~~a~~ the communication failure betv (n the first low-order node and the first high-order node is detected[[,]] :

the second high-order node ~~recognizes~~ recognizing the fir t)w-order node as the low-order node of the second high-order node itself according to the requ : ef from the first low-order node and ~~transmits~~ transmitting to the first low-order node, pr : :ss information including updated path information serving as new path information corr : onding to a transfer route ~~using~~ passing through the second high-order node ~~as a source node~~ : ~~he high-order node network to the first low-order node;~~ : and

the first low-order node ~~receives~~ receiving the process inf(1 iation with updated path information transmitted from the second high-order node and ~~update~~ s pdating the contents of a memory section, ~~for~~ which has ~~storing~~ stored path information to be i led to data when the data is transmitted to the second high-order node, on the basis of the upd; t 1 path information, wherein the selecting section selects the second output port based on the r cess information.

9.(currently amended): A service recovering method in a networl stem [[,]] comprising a high-order node network constituted by a plurality of high-(1 :r nodes and a plurality of low-order nodes, each of the low-order nodes is connected to c e of the plurality of high-order nodes, ~~in which~~ each of the high-order nodes ~~holds~~ having pa1 3 nformation corresponding to transfer ~~route~~ routes of data in the high-order node netw c :, each of the low-order nodes ~~receives~~ receiving the path information from a high-ord(1 .ode corresponding to the low-order node itself and, when ~~data is transmitted~~ transmitting data ic he high-order node, ~~adds~~ adding path information corresponding to a destination of the data t i ie data, each of the high-order nodes ~~transmits~~ transmitting ~~the~~ data ~~transmitted~~ received fro 1 a low-order node to

12

11184005.01

PAGE 14/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

another low-order node according to ~~the~~ path information added to the da... the plurality of high-order ~~node~~ nodes ~~network comprises~~ including a first and second h... -order ~~node~~ nodes, ~~and a second high-order node,~~ and the plurality of low-order nodes ~~compi~~... including a first low-order node, ~~serving as a low-order node of the first high-order node~~... ~~orein~~ the method comprising:

the first high-order node detecting a communication failur... etween the first low-order node and the first high-order node, wherein the first low-order nod... connected to the first and second high-order nodes via at least one physical line, and inclu... a first output port to transmit data to the first high-order node via said at least one physical lin... second output port to transmit data to the second high-order node via said at least one physic... line, and a selecting section to select one of the first and second output ports in order that the ... t low-order node transmits data to one of the first and second high-order nodes, and the fir... igh-order node detects the communication failure when the first output port is selected b... le selecting section;

the first high-order node ~~requests~~ requesting to the second ... gh-order node that the second high-order node serves as ~~the~~ a high-order node [[of]] for the ... t low-order node in place of the first high-order node when [[a]] the communication failure b... een the first low-order node and the first high-order node is detected[[.]];

the second high-order node ~~recognizes~~ recognizing the fir... ow-order node as the low-order node of the second high-order node itself according to the requ... ~~of~~ from the first high-order node, and ~~transmits~~ transmitting to the first low-order node, p... ess information including updated path information serving as new path information corr... onding to a transfer route ~~using~~ passing through the second high-order node ~~as a source in the~~... gh-order node ~~network to the first low-order node,~~ and

the first low-order node ~~receives~~ receiving the process inf... lation with the updated path information transmitted from the second high-order node an... ~~updates~~ updating ~~the~~ contents of a memory section, ~~for~~ which has ~~storing~~ stored path informat... to be added to data

13

when the data is transmitted to the second high-order ~~nodes~~ node, on the) is of the updated
path information, wherein the selecting section selects the second output) t based on the
process information.

10.(currently amended): A service recovering method in a netwol system[[,]]
comprising a high-order node network constituted by a plurality of high-(r er nodes and a
plurality of low-order nodes, each of the low-order nodes is connected to) e of the plurality of
high-order nodes, ~~in which~~ each of the high-order nodes ~~holds~~ having pat) nformation
corresponding to transfer ~~route~~ routes of data in the high-order node netw) ;, each of the
low-order nodes ~~receives~~ receiving the path information from a high-order ode corresponding to
the low-order node itself and, when ~~data is transmitted~~ transmitting data the high-order node,
~~adds~~ adding path information corresponding to a destination of the data t e data, each of the
high-order nodes ~~transmits~~ transmitting the data ~~transmitted~~ received fror low-order node to
another low-order node according to ~~the~~ path information added to the da the plurality of
high-order ~~node~~ nodes ~~network comprises~~ including a first and second hi -order ~~node~~ nodes,
~~and a second high-order node, and~~ the plurality of low-order nodes ~~compl~~ including a first
low-order node, ~~serving as a low-order node of the first high-order node~~ rein the method
comprising:

the first high-order node detecting a failure of the first high rder node itself,
wherein the first low-order node is connected to the first and second high der nodes via at least
one physical line, and includes a first output port to transmit data to the fi high-order node via
said at least one physical line, a second output port to transmit data to the ond high-order node
via said at least one physical line, and a selecting section to select one of first and second
output ports in order that the first low-order node transmits data to one of first and second
high-order nodes, and the first high-order node detects the failure of the f high-order node
itself when the first output port is selected by the selecting section;

14

11184005.01

PAGE 16/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

the first high-order node ~~requests~~ requesting to the second t ;h-order node that
the second high-order node serves as the high-order node [[of]] for the fii : ow-order node in
place of the first high-order node when a failure of the first high-order no 1 itself is detected[[,]];

the second high-order node ~~recognizes~~ recognizing the fir: t)w-order node as the
low-order node of the second high-order node according to the request of t : first high-order
node, and ~~transmits~~ transmitting to the first low-order node, process infoi n tion including
updated path information serving as new path information corresponding t a transfer route ~~using~~
passing through the second high-order node ~~as a source node in the high-~~ n ~~er node network and~~
~~does not comprise the first high-order node to the first low-order node,~~ ; ; r

the first low-order node ~~receives~~ receiving the process infi i ation with the
updated path information transmitted from the second high-order node ai (~~updates~~ updating the
contents of a memory section, ~~for~~ which has ~~storing~~ stored path informat c to be added to data
when the data is transmitted to the second high-order ~~nodes~~ node, on the : is of the updated
path information, wherein the selecting section selects the second output : rt based on the
process information.

11.(currently amended): A service recovering method in a netwo : ;ystem[[,]]
comprising a high-order node network constituted by a plurality of high-i i er nodes and a
plurality of low-order nodes, each of the low-order nodes is connected to (e of the plurality of
high-order nodes, and a high-order computer for managing the high-orde ·)de network, ~~in~~
~~which~~ each of the high-order nodes ~~generates~~ generating path informatio: t)rresponding to a
transfer ~~route~~ routes of data in the high-order node network, each of the 1 : -order nodes ~~receives~~
receiving the path information from a high-order node corresponding to i : low-order node itself
and, when transmitting data ~~is transmitted~~ to the high-order node, ~~adds~~ a l: ng path information
corresponding to a destination of the data to the data, each of the high-or 1 nodes ~~transmits~~
transmitting data ~~transmitted~~ received from a low-order node to another : : '-order node

15

11184005.01

PAGE 17/23 * RCVD AT 6/14/2004 4:13:48 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+2129408986 * DURATION (mm-ss):06-34

according to ~~the~~ path information added to the data, <u>the plurality of</u> high-) .er ~~node~~ <u>nodes</u> ~~network comprises~~ <u>including</u> the first <u>and second</u> high-order ~~node~~ <u>nodes,</u> ~~the second high~~ ~~order node, and~~ the plurality of low-order nodes ~~comprise~~ <u>including</u> a firs)w-order node, ~~serving as a low-order node of the first high-order node, wherein~~ the metl _comprising:_

the high-order computer detecting a failure of the first high rder node, wherein the first low-order node is connected to the first and second high-order nc s via at least one physical line, and includes a first output port to transmit data to the first l order node via said at least one physical line, a second output port to transmit data to the sec high-order node via said at least one physical line, and a selecting section to select one of the t and second output ports in order that the first low-order node transmits data to one of the fir nd second high-order nodes, and the high-order computer detects the failure of the first high -order node when the first output port is selected by the selecting section;

the high-order computer ~~requests~~ <u>requesting to</u> the second h ;h-order node that the second high-order node serves as ~~the~~ <u>a</u> high-order node [[of]] <u>for the</u> t low-order node in place of the first high-order node when the failure of the first high-order e ~~itself~~ is detected[[,]] :

the second high-order node ~~recognizes~~ <u>recognizing</u> the firs)w-order node as ~~the~~ <u>a</u> low-order node of the second high-order node <u>itself</u> according to the rec st of the high-order computer, and ~~transmits~~ <u>transmitting to the first low-order node, process</u> rmation including updated path information serving as new path information corresponding t a transfer route ~~using~~ <u>passing throug</u> the second high-order node ~~as a source node in the high-o~~ -node network and ~~does not comprise the first high-order node to the first low-order node,~~ a 1

the first low-order node ~~receives~~ <u>receiving the process inf</u> ation with the updated path information transmitted from the second high-order node ar ~~pdates~~ <u>updating the</u> contents of a memory section, ~~for~~ <u>which has</u> ~~storing~~ <u>stored</u> path informati to be added to data when the data is transmitted to the <u>second</u> high-order ~~nodes~~ <u>node,</u> on the is of the updated

16

11184005.01

path information, wherein the selecting section selects the second output ꞉ t based on the process information.

17